

APRIL 18, 1989
NARRATIVE FOR
BRULE, AURORA, AND DAVISON COUNTIES, SOUTH DAKOTA
OIL AND GAS DEVELOPMENT POTENTIAL MAP

INTRODUCTION:

These three counties are located in the southeast part of the state and east of the Missouri River. The topography is flat open grasslands.

Regionally, the Pre-Cambrian Sioux Ridge Arch strikes across the three counties in an east-west direction. The plunge of this structural high is to the west. Because of the structural high and faulting to the southwest, this area is void of Paleozoic rocks (Houser, 1987). Therefore, the Cretaceous rocks are unconformable to the Pre-Cambrian granites and Sioux Quartzite. This thin Cretaceous layer has the Fall River or Dakota Formation at its base, and the Pierre and Niobrara Formations forming the surface bedrock. This bedrock surface is mantled by Miocene and Pleistocene gravel up to 400 feet thick.

Brule County has the only two oil and gas wells drilled in this three county area. The #1 Fee, sec. 14, T. 103 N., R. 71 W., was drilled in 1948. It reached Pre-Cambrian granite at a drilling depth of 1365 feet and reported a show in the Cretaceous Dakota at 1363 feet. This well was plugged and abandoned. The #1 Warren Gaus was drilled in 1962, one township to the north. This well reported no shows and was plugged and abandoned. Currently, there is no oil or gas production in the three county area.

There are no Indian lands within the three county area.

OCCURRENCE POTENTIAL:

All three counties are classified as low occurrence potential except for T. 103 N., Rs. 67 through 72 W. This is based on a thin Cretaceous section, less than 2,000 feet thick (Mallory, 1972) and the lack of established oil or gas production.

There is no type log for the three county area.

DEVELOPMENT POTENTIAL:

Brule County has moderate and low development potential areas. The moderate development lands are a strip of townships that extend east to west across the central portion of the county. This potential is based on the show of oil from the #1 Fee well sec. 14, T. 103 N., R. 71 W. and its structural placement along the crest the Sioux Ridge Arch. The remaining townships in this county are low development potential. This is based on: 1) the lack of Paleozoic rocks; 2) the thin Cretaceous section and lack of production or significant shows of hydrocarbons.

Aurora and Davison counties are classified as low development potential. This is based on: 1) the lack of Paleozoic rocks; 2) the thin Cretaceous section and lack of drilling data and production or significant shows of hydrocarbons.

2 Based on the geologic setting, it is expected that this three county area will have a low level of surface disturbance due to oil or gas exploration in the next 15 years.

REFERENCES CITED

Houser, B. B., 1987, Southwestern bounding fault of the Sioux Quartzite, South Dakota: U. S. Geological Survey, Open File Report 87-626, 11p.

Mallory, W. W., (ed.) 1972, Geologic atlas of the Rocky Mountain Region: Rocky Mountain Association of Geologists, p.56.